

COLLECTING STACK PARTICULATE FILTER AND CHARCOAL CARTRIDGE SAMPLES

Purpose This Meteorology and Air Quality Group (MAQ) procedure describes the process to collect particulate filters and charcoal cartridge samples, deliver the samples to the analysis laboratory, and maintain proper sample chain-of-custody.

Scope This procedure applies to the collection of particulate filter and charcoal cartridge samples from sampled stacks as part of the Rad-NESHAP Project. The collection of filters from sampled stacks at the Los Alamos Neutron Science Center is not covered by this procedure.

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Procedure**

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02/06/06

CONTROLLED DOCUMENT

This copy is uncontrolled if no red stamp is present on printed copies.
Users are responsible for ensuring they work to the latest approved revision.

General information about this procedure

Attachments This procedure has the following attachments:

Number	Attachment Title	No. of pages
1	Stack Sample Data Form and Chain-of-Custody Record	1
2	Stack Sample Data Form and Chain-of-Custody Record for Unscheduled Sample Collection	1
3	Memo to Analytical Laboratory	2
4	Memo to Shipping Department	1
5	Filter Clumping Strategy	2

History of revision

Revision	Date	Description Of Changes
0	03/29/96	New document.
1	12/16/96	Revised to include inspection of sampler “O” ring, changes in group management, and worker safety.
2	02/06/98	Revised to include blank filters and wording changes.
3	02/19/98	Revisions to include CMR procedural requirements.
4	6/2/00	Added HCP as attachment 1, removed list of stacks, and made wording changes throughout.
5	3/13/01	Changed sequence of steps in filter and charcoal collection, modified “Stack Sample Data Form” to include System Inspection Checklist.
6	8/2/01	Revised purpose wording to include chain of custody, added reference to form, added steps on receiving custody of samples back from HPAL.
7	3/29/02	Added steps on donning and removing gloves during survey for activity, added step to sign for custody when receiving samples from HPAL at TA-55, added documentation of compliance with DOT regulations, and added attachment 5 on “clumping” of samples for gamma spectroscopy analysis.
8	6/4/02	Update details of several steps and modify step on surveying filters with radiation survey instrument.
9	12/22/03	Updated to reflect use of new off-site analytical laboratory.
10	2/11/05	Added chapter <i>Preparing to composite stack sample filters</i> from MAQ-124, removed HCP (attachment 1), and added overview to chapter <i>Delivering charcoal samples for shipping</i> .
11	02/10/06	Quick-change revision to update DOT shipping requirements and reflect inclusion of additional samples in the “clumping strategy” in Attachment 5.

General information, continued

Who requires training to this procedure?	<p>The following personnel require training before implementing this procedure:</p> <ul style="list-style-type: none">• MAQ technicians, MAQ staff members, and HSR-1 Radiation Control Technicians (RCTs) assigned to perform all or part of this procedure• HSR-1 RCTs who may need to perform unscheduled sample collections
Training method	<p>The training method for this procedure is mentored training by a previously trained employee and is documented in accordance with the procedure for training (MAQ-024).</p> <p>Annual retraining is required and will be by self-study (“reading”) training.</p>
Prerequisites	<p>In addition to training to this procedure, the following training is also required before performing this procedure:</p> <ul style="list-style-type: none">• Radiological Worker training• Facility-specific requirements for each facility• Ladder safety training• Signed IWD for the applicable facility <p>A “Q” level security clearance is also required for some facilities.</p>
Definitions specific to this procedure	<p><u>PPE</u>: Personnel Protective Equipment is equipment used to protect the individual from becoming contaminated from hazardous or radioactive material during an operation.</p> <p><u>Fibrous side of filter</u>: The glass-fiber particulate filters used for stack sampling have a very smooth side and a coarse side having visible glass fibers. The coarse side is considered the “fibrous” side.</p>
References	<p>The following documents are referenced in this procedure:</p> <ul style="list-style-type: none">• MAQ-024, “Personnel Training”• MAQ-026, “Deficiency Reporting and Correcting”• MAQ-124, “Compositing Stack Sample Filters”• MAQ-601, “Collecting & Processing Stack Air Particulate and Vapor Samples from TA-53”• MAQ-SOW-07, “Statement of Work for Gamma Spectroscopy of Stack Charcoal and Particulate Filter Samples”

Background and overview of stack filter change

Background The Environmental Protection Agency's National Emission Standard for Emissions of Radionuclides Other Than Radon From Department of Energy Facilities, 40 CFR 61, Subpart H (NESHAP) and facility-specific requirements (e.g., TSRs and OSRs) require sampling for various radionuclides from several LANL facilities. Included in these requirements is the need to sample stack emissions for particulate and vapor radioactive materials. Most facilities at LANL that work with radioactive materials have the potential to emit particulate material emissions. As such, particulate sampling is the most common stack sampling conducted at LANL. Glass fiber filters are used for this sampling.

A small number of facilities at LANL also have the potential to emit vapor emissions. These emissions are not readily collected on filter paper so a charcoal-sampling cartridge is used in series with the filter paper to collect these radionuclides, where applicable.

Overview of filter change This procedure describes the four processes required to perform the sample change:

- preparing forms, sample filters, and charcoal cartridges
- removing and replacing sample filters and charcoal cartridges
- delivering the samples to an analytical laboratory
- completing the required documentation

Frequency of filter change A stack-sampling period is normally a one-week, 7-day period. The start and end times of the period are determined by the actual time of sample filter and/or charcoal cartridge change. A trained MAQ technician or staff member changes the filters, normally each week. Extra change cycles may be necessary as part of maintenance or test activities.

After an extended holiday, samples may be changed on the morning of the next working day, if the facility and the Rad-NESHAP Project Leader agree. Other sample change schedules may be arranged for extended holiday periods to meet facility needs.

Worker safety

Performing work safely

DO NOT perform work under conditions you consider unsafe. Before beginning work described in this procedure, review safety needs and requirements, identify hazards, and develop hazard mitigation measures. Be aware that facility configurations and hazards may change between visits. Hazards to assess include, but are not limited to the following:

Rotating machinery and electrical equipment - Work described in this procedure is performed in the vicinity of fans, motors, and other facility equipment. Do not work in the vicinity of exposed conductors or if guards are not in place on operating facility equipment.

Radiological hazards - Stack sampling locations are often radiologically controlled. Be sure to comply with all facility-specific PPE requirements before entering controlled areas.

Roofs and scaffolding - Work described in this procedure will take place on roofs and/or scaffolding. **Fall protection equipment must be used if the performance of work requires personnel to be within 6 feet of the edge of a 6-foot or greater drop.** Additional safety precautions and equipment must be considered, and when appropriate, used to minimize the risks of injury resulting from falling equipment, lightning strikes, exposure, and other potential hazards. Safety precautions to be considered related to working at heights include:

- Use of hard-hats
- Observing safe ladder practices
- Delaying work because of dangerous weather conditions

DO NOT work on roofs and/or outdoor scaffolding during lightning storms or when lightning storms are in the area.

Facility management units - Work control is the responsibility of the Facility Manager. Obtain approval from facility management before beginning work described in this procedure. Ensure you have completed all facility-specific training requirements (see prerequisite training requirements on page 2).

Transportation requirements

Transport of Class 7 (Radioactive) materials is regulated according to 49CFR173, Subpart I. This regulation establishes thresholds above which special packaging and handling is required. Routine stack samples do not meet these thresholds, and can be treated as non-radioactive with no special packaging.

Note that if the sample activities are less than the threshold specified in the chapter *Particulate Filter and Charcoal Cartridge Collection*, step #21, then historical data shows that they will also be within the DOT limits.

Particulate filter and charcoal cartridge preparation

Overview Before sample filters and charcoal cartridges may be changed, filter, cartridges, and required documentation must be prepared. The materials listed below must be collected and used during the preparation process.

Required materials Collect the following materials:

- Hollingsworth and Vose Company LB-5211-A0 (or equivalent) glass-fiber filter media filters
- Hi-Q Environmental Products Company catalog number TC-12 (or equivalent) analytical carbon cartridges
- glassine envelopes
- small ziploc bags
- medium ziploc bags
- large ziploc bags
- Stack Sample Data Form and Chain-of-Custody Record (Attachment 1)
- Clipboard
- plastic sample box for transporting required materials in the field

Steps to prepare filters and cartridges Prepare the glass-fiber filters and charcoal cartridges, in accordance with the following steps:

Step	Action
1	Prepare a Stack Sample Data Form and Chain-of-Custody Record (Attachment 1) for each filter and the filter clump (see Attachment 5) by placing a bar code sticker on the form and recording the sampling facility identification (TA, Bldg., ES).
2	Label the back (fibrous side) of the new glass-fiber filter for each sampled stack with the location (TA, Bldg., ES) and the sampling (xx/yy – xx/yy) period dates. Each week, alternate pen ink between red and green to uniquely identify each weekly set.
3	Label one (1) trip blank “75000101” and record the dates of the sampling period on the filter.
4	Label a single filter as a matrix blank filter, “75000103,” and label seven filters as a clump matrix blank clump, “75000105” and record the dates of the sampling period on the filter.
5	Apply a label, alternating colors each week between red and green, to the side of a new charcoal cartridge for each applicable stack with the location (TA, Bldg., ES) and the sampling-period dates. Apply label so flow arrow is visible and label is readable when arrow points down.

Steps continued on next page.

Particulate filter and charcoal cartridge preparation, cont.

Step	Action
6	Place each filter in a clean glassine envelope. Place all glassine envelopes for the single filters and clumps in new small ziploc bags.
7	Place each charcoal cartridge with a new small ziploc bag.
8	Separate the cartridges, by site, in medium Ziploc bags.
9	Place small ziploc bags containing glassine envelopes and the medium ziploc bags containing charcoal cartridges into a larger ziploc bag.
10	Secure the Stack Sample Data Form and Chain-of-Custody-Record (Attachment 1) to the clipboard.
11	Place the bag containing the filters, charcoal cartridges, and the clipboard holding the forms into the plastic sample box.

Particulate filter and charcoal cartridge collection

Overview A trained **MAQ technician**, **MAQ staff member**, or **HSR-1 RCT** normally changes the filters and charcoal cartridges on a weekly (7 day interval) basis. However, different cycles may be necessary as part of maintenance or test activities. Before collecting samples, collect the equipment listed below.

Equipment and materials required for collecting samples A plastic sample box, containing the following materials will be used in the field for collecting filters and cartridges:

- prepared glass-fiber filters
- prepared charcoal cartridges
- Stack Sample Data Form and Chain of Custody Records for field data
- small Ziploc bags
- medium Ziploc bags
- large Ziploc bags
- disposable gloves
- tweezers
- Kimwipes
- three spare Parker part number 142 (or equivalent), 2.362 in. inside diameter “O” rings (for filter holders)
- three spare Hi-Q Environmental Products Company part number 9455-K21 (or equivalent) gaskets and part number 9452K96 (or equivalent) “O” rings (for charcoal cartridge holders)
- Lubricant, for maintenance, as needed

Carry a portable gross alpha/gross beta survey instrument in the government vehicle when collecting samples. When collecting samples from the CMR building (except Wing 9), hand carry the portable gross alpha/gross beta survey instrument in the building.

TA-55 Sample pickup At TA-55, the sample exchange steps below are performed by HSR-1 Radiological Control Technicians, and placed in a lock box at TA-55 PF-3 Room 163. MAQ employees pick up samples from this location and include them in the shipment described in the next chapter.

Steps to exchange filters To change a glass-fiber filter and/or charcoal cartridge, perform the following steps:

Particulate filter and charcoal cartridge collection, cont.

Step	Action
1	When entering a facility, comply with all facility-specific sign-in, dosimetry, and notification requirements. Before continuing with sample collection activities, see the chapter <i>Worker safety</i> and review safety needs and requirements. <u>DO NOT</u> perform work under conditions you consider unsafe.
2	Put on a pair of disposable gloves when handling stack samples at any point during collection and survey. Disposable gloves are the minimum required PPE for performing sample filter and charcoal cartridge changes. Facilities may have additional PPE requirements for facility access.
3	Verify visual and sound of sampling system is normal.
4	If a charcoal cartridge is to be changed, open the cartridge holder. If there is no charcoal cartridge on the system, proceed to Step 10.
5	Remove the charcoal cartridge and place it in the small ziploc bag.
6	Insert this ziploc bag, containing the cartridge, into the medium ziploc bag.
7	Examine the charcoal cartridge holder for any dirty, damaged, or deteriorated parts. Clean, repair, or replace as needed. Dispose of waste such as gaskets or o-rings with used gloves (see step 15 below).
8	Place the new charcoal cartridge in the holder ensuring that the cartridge is aligned according to the flow direction arrow on the side of the cartridge.
9	Reconnect the charcoal cartridge holder and hand-tighten the assembly.
10	Open the stack filter holder.
11	Remove glass fiber filter and insert into glassine envelope/ziploc bag.
12	Examine the filter holder for any dirty, damaged, or deteriorated parts. Clean, repair, or replace as needed. Dispose of waste such as gaskets or o-rings with used gloves (see step 15 below).
13	Place the new glass-fiber filter in the filter holder with the fibrous, labeled side toward the vacuum source, on the support grid. NOTE: This arrangement should be used although standard practice is to place the fibrous side toward the flow stream. LANL has developed depth-of-burial factors for these filters with the fibrous side toward the vacuum source that warrants this arrangement.
14	Reassemble the sample filter holder and hand-tighten.
15	Wipe tip of forceps on disposal glove and remove gloves (inside out). Dispose of gloves at facility rad trash when available. When outside a facility, take gloves in a ziplock bag to next available rad trash.

Steps continued on next page.

Particulate filter and charcoal cartridge collection, cont.

Step	Action
16	Record the stop date/time and the <i>sample period</i> start date/time on the Stack Sample Data Form and Chain-of-Custody Record (Attachment 1) for the removed filter and charcoal cartridge and the new filter and charcoal cartridge. This step may be performed after returning to vehicle, if desired.
17	After replacing filter and cartridge, verify normal operating condition of stack sample system components listed on Stack Sample Data Form, keeping in mind the following: <ul style="list-style-type: none"> • Sample flow on rotometer is within the allowable range as provided by the Rad-NESHAP Project Leader. • Ensure the rotometer is free of debris. If the sample system condition or the stack sample flow rates are unsatisfactory, record a description of the problem in the “Remarks” column and notify the facility manager and RN team leader. If the system is in the CMR building, notify the CMR Operations Center.
18	Go to the next sampling site at this facility and repeat steps 1 -- 17.
19	When exiting a facility after collecting samples and installing new filters/cartridges, address all facility-specific sign-out and notification requirements.
20	Store the samples in the vehicle during sample collection. Keep the vehicle locked, even behind security fence areas, when filters are stored inside.

Steps continued on next page.

Particulate filter and charcoal cartridge collection, cont.

Step	Action
21	<p>When returning to the government vehicle after collecting the filters and cartridges from CMR Wing 9 or any facility other than CMR Wings 2, 3, 4, 5, or 7, survey the outside of each filter and cartridge with the portable gross-survey instrument.</p> <p>After collecting filters from CMR Wings 2, 3, 4, 5, or 7 and before leaving the wing where the filters were collected, survey the outside of each filter using either the portable gross-survey instrument or a survey instrument inside the facility.</p> <ul style="list-style-type: none"> • If the gross <i>alpha</i> count is greater than 5,000 counts per minute, or if the gross <i>beta</i> count is greater than 50,000 counts per minute, place the stack sample in a separate ziploc bag to prevent cross contaminating the other stack samples. Call an HSR-1 RCT for a more thorough counting. Contact the RN team leader and SUP-5 for guidance on special shipping and handling requirements. • If the gross <i>alpha</i> count is 5,000 counts per minute or less and the gross <i>beta</i> count is 50,000 counts per minute or less, isolating stack samples is not necessary.
22	<p>After collecting the filters and cartridges from all sampling systems at the CMR Building, leave a copy of the Stack Sample Data Form and Chain-of-Custody Record for field data containing the current reading of sampling system airflow acceptable ranges with the CMR Operations Center before leaving the facility.</p>
23	<p>Follow the instructions in the next chapter of this procedure to deliver the samples for shipping to an analytical laboratory.</p>

Delivering particulate filter samples for shipping

Overview

Deliver the collected particulate glass-fiber filter samples (not cartridges) to the shipping group to be sent to an analytical laboratory for analysis. The form ‘Chain of Custody and Screening Data for Shipping Weekly Stack Samples’ summarizes all the samples to be shipped, is generated by the database after sample collection. Chain of custody documentation is transferred from the field forms to this new form. A memo to the laboratory details what they will receive and analyses requirements (Attachment 3). A second memo (Attachment 4) to the shipping department shows maximum activity in nanocuries/gram of sample and net weight for all particulate sample filters.

Delivery to analytical laboratory

To deliver the filter samples for analysis, perform the following steps.

Step	Action
1	In the office, prepare the documents listed below: <ul style="list-style-type: none"> • “Chain of Custody and Screening Data for Shipping Weekly Stack Samples”, printed from RADAIR database. • Memo to the Analytical Laboratory (Attachment 3) • Memo to the shipping department.(Attachment 4) • Express shipping request, available on the LANL web site via the MAQ Group Office. Chain of Custody and Screening Data for Shipping Weekly Stack Samples
2	Label large ziplock bags: one for samples and one for paper work.
3	Prior to submittal, ensure all filters are present and grouped properly (see Attachment 5 or a revised clumping strategy, if applicable).
4	Sign the line labeled “Samples shipping V&V” on the “Chain of Custody and Screening Data for Shipping Weekly Stack Samples” to indicate that all samples are present and packaged for shipping.
5	Relinquish chain of custody on each field sample collection form to the computer-generated form “Chain of Custody and Screening Data for Shipping Weekly Stack Samples”. Include the latter form with the samples and retain the field c-of-c forms.
6	Transport the samples to shipping department at SM-30.
7	Prepare FedEx shipping box. Have SUP-3 personnel make copies of all documents to accompany samples.
8	Place samples in shipping box. Place original documents in ziplock bag then into shipping box. Seal box and hand off to SUP-3 personnel. Pick up will be by FedEx. Retain copies of documents for records.

Delivering charcoal cartridge samples to TA-53 for storage

Overview

Deliver the collected charcoal cartridge samples to TA-53-Building 3, TOFI area, for storage.

At the time of delivery, log the samples into logbook in the locked cabinet.

Delivery for storage

Perform the following steps when delivering the samples for storage to TA-53 , building 3, room TOFI:

Step	Action
1	Print name, sign, and record the date and time in the log book and the Stack Sample Data Form and Chain-of-Custody Records. Transfer custody of the charcoal cartridges samples to locked cabinet. Keep the Stack Sample Data Form and Chain-of-Custody Records for MAQ's records.
2	Seal large Ziploc bag of samples with custody tape and place it in the locked cabinet in TOFI, TA-53-Bldg 3, room M105.

Shipping charcoal samples

The charcoal samples typically are collected on a Thursday and shipped with LANSCE samples collected and shipped on the following Tuesday. See procedure MAQ-601 for the shipping details. If for some reason these samples are shipped without the LANSCE samples, see the next chapter.

Delivering charcoal samples for shipping

Determine method of shipping

Samples will be screened by HSR-1 RCTs before removal from area. Based on the current expected rad levels, special packaging is not required. However, if rad surveys by HSR-1 indicate rad levels over 0.5 mrem/hr at the surface, MAQ will use SUP-5 services for special packaging and shipment protocols, instead of the steps below.

Transferring the samples to SUP-3

At desired delivery time, transfer chain of custody to SUP-3 for delivery to the analytical laboratory, by Federal Express.

Step	Action
1	Prior to submittal, prepare these documents: <ul style="list-style-type: none">• 'Chain of Custody and Screening Data for Shipping Weekly Stack Samples' (Attachment 6)• Memo to the Analytical Laboratory (Attachment 3)• Memo to the shipping department. (Attachment 4)• Shipping request, available on the LANL web site via the MAQ Group Office.
2	Print name, sign, and record the date and time in the log book in TOFI to document that the samples are being transferred from the locked cabinet for shipping.
3	Check off and initial the Chain of Custody and Screening Data for Shipping Weekly Stack Samples to show that all samples shown on that page were placed in the shipping container.
4	Label large ziplock bags: one for samples and one for paper work.
5	Transport the samples to shipping department at SM-30.
6	Prepare FedEx shipping box . Have SUP-3 personnel make copies of all documents to accompany samples.
7	Place samples in shipping box. Place original documents in ziplock bag then into shipping box. Seal box and hand off to SUP-3 personnel. Pick up will be by FedEx. Retain copies of documents for records.

Review of analytical results

The analytical laboratory will send an EDD (electronic data deliverable) of the results to the MAQ analytical chemistry coordinator. The hard copy of the analytical report follows within a couple of weeks. If any unusual isotopes or quantities are observed, investigate the issue to determine if a problem is present.

Unscheduled stack sample collection by an HSR-1 RCT

Overview

Unusual circumstances at a facility may require an HSR-1 Radiation Control Technician (RCT) to immediately collect the stack particulate filters and/or charcoal cartridges. Performing the standard collection and documentation process described previously in this procedure may not be possible. These situations must be accommodated, but minimized. Extreme care must be taken to ensure the validity of the samples for demonstrating regulatory compliance.

Unscheduled collection by an RCT

For an unscheduled sample collection, perform the following steps:

Step	Action
1	Prepare the new particulate filters and charcoal cartridges by following the steps specified in the <i>Particulate filter and charcoal cartridge preparation</i> chapter of this procedure. Record the sample on the Stack-Sample Data Form and Chain-of-Custody Record for Unscheduled Sample Collection (Attachment 2).
2	Change the samples by following the steps specified in the <i>Particulate filter and charcoal cartridges collection</i> chapter of this procedure (except use Attachment 2 in place of Attachment 1). Record all data on the Stack-Sample Data Form and Chain-of-Custody Record for Unscheduled Sample Collection (Attachment 2). Record the date and time the filter was removed, the date and time the new filter was installed, and the timer reading. Complete the Sample System Inspection checklist.
3	Record the reason for the unscheduled sample collection on the Particulate Stack Sample Data Form and Chain of Custody Record for Unscheduled Sample Collection (Attachment 2).
4	Immediately notify MAQ of the unscheduled sample collection by calling 5-8855. During off-hours, leave a message on voice mail. FAX the completed Stack Sample Data Form and Chain-of-Custody Record for unscheduled sample collection to MAQ at 5-8858.

Preparing to composite stack sample filters

Overview Every six months, before filters can be composited, the list of filters to be composited, blank filters, and various equipment and supplies must be obtained. Most of the data is compiled by MAQ and forwarded to the analytical laboratory where the compositing is performed.

Ensure all alpha and beta data are loaded Do not perform the compositing process until all the electronic analytical data results for alpha and beta counts have been loaded into the MS Access database. If all these data are not present, the printed forms may be incorrect.

Steps to prepare for compositing MAQ stack sampling team personnel perform the following steps to prepare for compositing sample filters:

Step	Action
1	Obtain from Access database the following: <ul style="list-style-type: none">Stack filter Composite ChecklistChain of Custody and Screening Data for Composite Shipping.
2	Assemble 100 blank filters. Note: The blanks are used as composite blanks (quality control checks) and are processed identically to the composite sample filters.
3	Chose two samples from a previous quarter, to be submitted as duplicates and indicate on the checklist which samples are to be used.
4	Retrieve stored samples from TA-54, 1001 (“Cave”).
5	Send all the above items to the analytical laboratory with a cover letter. Keep a backup copy of the paperwork until the final versions are returned with the data package from the analytical laboratory.

Records resulting from this procedure

Records

The following records generated as a result of this procedure are to be submitted to the records coordinator **within two months** of generation:

- Stack-Sample Data Form and Chain-of-Custody Record (Attachment 1)
- Stack-Sample Data Form and Chain-of-Custody Record for Unscheduled Sample Collection (Attachment 2), when used
- Chain of Custody and Screening Data for Shipping Weekly Stack Samples(Attachment 6)
- Express Shipping Document
- Analysis laboratory memo (Attachment 3).
- Particulate stack filter samples radioactivity memo to shipping (Attachment 4).
- Analytical results from the analytical lab are stored in the records room, as they are returned and reviewed.

MAQ, Meteorology and Air Quality Group

Stack Sample Data Form and Chain-of-Custody Record

This form is from MAQ-109

Facility Name: Analysis Requested: Gross Alpha, Gross Beta, Gamma Spectroscopy							Sample System Inspection (Place a check (√) in box to indicate normal operation/conditions. Record sample flow in lpm/units)							Place Barcode Tracking Sticker Here	
Sample Identification TA – Bldg – ES	Date Start	Time Start	Date Stop	Time Stop	Matrix	Container Type	Stack Fan	Sample Flow	Filter House	Sample Line	Stack Con'd	Timer reading	Remarks		
					Filter	Glassine Envelope									
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Sample Collector (print and sign) _____

Comments:

Relinquished by (print and sign)	Date Time	Relinquished by (print and sign)	Date Time	Relinquished by (print and sign)	Date Time	Relinquished by (print and sign)	Date Time
Received by (print and sign)		Received by (print and sign)		Received by (print and sign)		Received by (print and sign)	

UNSCHEDULED SAMPLE COLLECTION

MAQ, Meteorology and Air Quality Group

UNSCHEDULED SAMPLE COLLECTION

Stack Sample Data Form and Chain-of-Custody Record

This form is from MAQ-109

Facility Name:							Sample System Inspection (Place a check (✓) in box to indicate normal operation/conditions. Record sample flow in lpm/units)						Place Barcode Tracking Sticker Here	
Analysis Requested: Gross Alpha, Gross Beta, Gamma Spectroscopy														
Sample Identification TA – Bldg – ES	Date Start	Time Start	Date Stop	Time Stop	Matrix	Container Type	Stack Fan	Sample Flow	Filter House	Sample Line	Stack Con'd	Timer reading	Remarks	
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Environmental Stewardship Division

Meteorology & Air Quality Group
PO Box 1663, MS J978
Los Alamos, New Mexico 87545
(505) 665-8855/Fax: (505) 665-8858

Date:
Refer to: ENV-MAQ: 03-

Ms. Lori Pacheco
Paragon Analytics, Inc.
225 Commerce Drive
Fort Collins, CO 80524

SAMPLE SHIPMENT - Stack Glass-fiber Filter Weekly samples [complete set R05xxxx]

Dear Lori:

Enclosed with this letter are **XX** glass-fiber filter samples for which we require analyses under LANL purchase order number **YYYY**. Standard turnaround time (per our SOW) is requested. To summarize:

Applicable
SOWs

- MAQ-SOW-24 (most recent version)

Sample Types:

- These samples are collected weekly from various stacks around the laboratory during **CY 2006**.
- The filter material is glass-fiber.

Analysis
Requirements:

- All glass-fiber filter samples are to be analyzed for the following constituents: Gross alpha/beta and gamma-emitting nuclides.
- Detection limit requirements vary and are shown in the SOWs.

Screening Data

- Alpha, beta and gamma screening data are shown on the Chain-of-Custody.

Shipping Data:

- For shipping purposes, we summed the maximum alpha, beta, and gamma screening data and calculated results as nanocuries/gram.

Sample
Retention

- After instrumental counting, all samples will be retained under full chain-of-custody for subsequent semiannual compositing.

If you require further information please contact me at (505) 665-8866 during working hours.

Sincerely

Debra Archuleta
MAQ Meteorology and Air Quality

DA:lrn

Att: Table 1 – Chain of Custody and Screening Data

Cy: Dave Fuehne, MAQ
MAQ File



To/MS: Tom Houston, SUP-3
From/MS: Debra Archuleta, J978
Phone/Fax: 5-8866/5-8858
Symbol: ENV-MAQ:06-
Date: Mmdd, yyyy

Subject: Particulate Stack Filter Samples **Rxxyyzz** being sent for radioactivity analysis

These air filter samples are being shipped to an analytical laboratory for radioactivity analysis to determine specific levels of gross alpha/beta and gamma activities. These are exhaust stack samples, and are expected to contain only the low-levels radionuclides that pass through the HEPA filtration units. The major isotopes are presently unknown, but the samples might reasonably be expected to contain traces of: U, Be-7, Ra-222 and K-40.

Similar samples have been collected at LANL for the past 25 years. Maximum levels of radioactivity actually observed in previous weekly samples taken during CY 2002 have been used to calculate the maximum radioactivity that could be contained in this shipment:

Maximum activity: 0.3 nanocuries/gram of sample, net weight.

FILTER CLUMPING STRATEGY

In recent history, only a few sample filters have ever had any detectable gamma-emitting radionuclides. However, it is desired to continue gamma spectroscopy on these samples, to ensure that the stacks are monitored for all potentially significant radionuclides.

To keep this level of security but reduce the cost, time, and effort of gamma spectroscopy analyses, the following strategy is adopted for the stack sample filters, similar to that used in the AIRNET samples. A complete description of the statement of work appears in MAQ-SOW-24.

Stacks with low potential for gamma activity will be “clumped” together, in groups of seven or eight sample filters per clump. Gamma spectroscopy will be conducted on the entire clump, and if the analysis reveals that there is no activity beyond the minimal detected activity, no further action will be taken. Activity of “< MDA” will be reported for each of the nuclides, for each filter in the clump. Activity above the MDA will result in the clump being separated and each counted individually. If one filter is expected to be “hot” (as determined through gross alpha/beta screening), and its gamma spectroscopy analysis reveals that it accounts for all of the initially detected activity in the clump, analysis on the subsequent filters is unnecessary.

Gross alpha and gross beta analysis will still be conducted on each filter individually. Charcoal filters will still be analyzed individually, as will paper filters from facilities with higher potential for gamma activity.

When submitting samples to the analytical laboratory, the samples will be submitted in groups associated by clumps. A single chain-of-custody form will be used for each group as described below.

At the beginning of CY 2006, the following breakdown was used for clumping paper filters. Note that MAQ Rad-NESHAP staff can change the clump groupings if warranted by operational needs.

TA-3 Bldg-29 (Chemical & Metallurgical Research facility), “A” Clump (0300029AC)
These filters have a greater potential for activity than other CMR samples.

TA-03-BLDG-29-ES-23	(Wing 4)
TA-03-BLDG-29-ES-24	(Wing 4)
TA-03-BLDG-29-ES-28	(Wing 5)
TA-03-BLDG-29-ES-29	(Wing 5)
TA-03-BLDG-29-ES-44	(Wing 9, Hot Cells)
TA-03-BLDG-29-ES-45	(Wing 9, Hot Cells)
TA-03-BLDG-29-ES-46	(Wing 9, Hot Cells)

Continued on next page

FILTER CLUMPING STRATEGY, CONTINUED

TA-3 Bldg-29 (Chemical & Metallurgical Research facility), “B” Clump (0300029BC)

These filters have a lower potential for activity than other CMR samples.

TA-03-BLDG-29-ES-14 (Wing 2)
TA-03-BLDG-29-ES-15 (Wing 2)
TA-03-BLDG-29-ES-19 (Wing 3)
TA-03-BLDG-29-ES-20 (Wing 3)
TA-03-BLDG-29-ES-32 (Wing 7)
TA-03-BLDG-29-ES-33 (Wing 7)
TA-03-BLDG-29-ES-37

The Non-CMR Gamma Clump (NONCMRGC)

These filters are from facilities outside of CMR, with low potential for gamma activity.

TA-03-BLDG-102-ES-22
TA-48-BLDG-01-ES-54
TA-50-BLDG-01-ES-02
TA-50-BLDG-37-ES-01
TA-50-BLDG-69-ES-03
TA-55-BLDG-04-ES-15 (old sampler)
TA-55-BLDG-04-ES-16 (old sampler)

The new samplers installed at TA-55 Bldg 4 at the end of 2005 consist of four independent samplers on each of the two monitored stacks. These eight samples will be submitted under their own clump identification (550004GC).

TA-55-BLDG-04-ES-15-A (individual sample ID 5500415A)
TA-55-BLDG-04-ES-15-B (individual sample ID 5500415B)
TA-55-BLDG-04-ES-15-C (individual sample ID 5500415C)
TA-55-BLDG-04-ES-15-D (individual sample ID 5500415D)
TA-55-BLDG-04-ES-16-A (individual sample ID 5500416A)
TA-55-BLDG-04-ES-16-B (individual sample ID 5500416B)
TA-55-BLDG-04-ES-16-C (individual sample ID 5500416C)
TA-55-BLDG-04-ES-16-D (individual sample ID 5500416D)

Non-Clumped filters (individual analyses)

These filters have the highest potential for gamma activity

TA-48-BLDG-01-ES-07
TA-48-BLDG-01-ES-60

Note that after the “old samplers” at TA-55 Building 4 are shut off, these two non-clumped filters will be put in the NONCMRGC clump in their stead. This will keep the same number of filters in that clump and allow for similar analytical techniques on all clumps. The years 2002 – 2005 have shown no particulate gamma on these two TA-48 filters.

Stack Sample Data Form and Chain-of-Custody Record

This form is from MAQ-109

Facility Name: Analysis Requested: Gross Alpha, Gross Beta, Gamma Spectroscopy							Sample System Inspection (Place a check (√) in box to indicate normal operation/conditions. Record sample flow in lpm/units)					Place Barcode Tracking Sticker Here	
Sample Identification TA – Bldg – ES	Date Start	Time Start	Date Stop	Time Stop	Matrix	Container Type	Stack Fan	Sample Flow	Filter House	Sample Line	Stack Con'd	Timer reading	Remarks
					Filter	Glassine Envelope							
					Filter	Glassine Envelope							
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Sample Collector (print and sign) _____

Comments:

Relinquished by (print and sign)	Date Time	Relinquished by (print and sign)	Date Time	Relinquished by (print and sign)	Date Time	Relinquished by (print and sign)	Date Time
Received by (print and sign)		Received by (print and sign)		Received by (print and sign)		Received by (print and sign)	

